

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: **Domain switching behaviors in PZT/SRO/DSO.** Domain evolution under linear 0→9 V observed by *in-situ* TEM. The time duration of the applied voltage is 3 s. The applied voltage starts at the beginning of the video.

File Name: Supplementary Movie 2

Description: **Domain switching behaviors in STO/PZT/SRO/DSO.** Domain evolution under linear 0→−6 V observed by *in-situ* TEM. The time duration of the applied voltage is 20 s. The applied voltage starts at the beginning of the video.